

COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
West Central Regional Office

STATEMENT OF LEGAL AND FACTUAL BASIS

NanoChemonics Holdings, LLC
Pulaski, Virginia
Permit No. WCRO-20322

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, NanoChemonics Holdings, LLC has applied for a Title V Operating Permit renewal for its Pulaski facility. The Department has reviewed the application and has prepared a Title V Operating Permit.

Engineer/Permit Contact: _____ Date: _____

Air Permit Manager: _____ Date: _____

FACILITY INFORMATION

Permittee

NanoChemonics Holdings, LLC
1 Magnox Drive
Pulaski, VA 24301

Facility

NanoChemonics Holdings, LLC
4 Magnox Drive
Pulaski, VA

County-Plant Identification Number: 155-0011
Registration No.: 20322

First Renewal of Title V Operating Permit

SOURCE DESCRIPTION

NAICS Code: 325131 - This manufacturing plant produces magnetic iron oxide pigment powders for recording and printing applications and is a Title V major source of carbon monoxide. In simplified form, the process consists of (a) aqueous digesting of iron or steel and aqueous metal (such as cobalt) adsorption, all without air emissions, (b) iron oxide powder/dust drying, granulating and material handling, (c) high temperature gas phase oxidation-reduction reactions of iron oxide dust/powder in a group of 22 small batch kilns/calciners, (d) additional high temperature reduction of a portion of the material in a continuous reduction kiln/calcliner, (e) annealing with minimal emissions after fabric filtering, and (f) powder/dust mulling, miscellaneous processing, material handling and storage, and bagging.

The high temperature reduction reactions in the kilns/calciners include the use of carbon monoxide (CO) in the reducing gas atmosphere and results in CO emissions exceeding 100 tons/yr due to venting the unreacted portion of the gas. This quantity of CO emissions is the reason for this plant needing a Title V operating permit, even though annual permit fees are not applied to CO emissions. The process emission, other than from kilns/calciners, is particulate matter (dust/powder) from a multitude of processing points inside buildings, including several dryers, and is all well controlled by several baghouse/fabric filter dust collectors and a few scrubbers. There are also 3 boilers totaling 69.1 million Btu/hr input capacity fired with natural gas and standby No. 2 fuel oil. Additional plant fuel burning is natural gas, but each additional unit is small enough to be exempt from regulations (below 10 million Btu/hr).

All equipment at this facility is covered under the Existing and New Source Regulations at 9 VAC 5 Chapters 40 and 50. The source is located in an attainment area for all pollutants, and is not subject to PSD, NSPS, MACT or NESHAP requirements, including the Magnetic Tape NESHAP.

COMPLIANCE STATUS

The facility was last inspected on June 15, 2006 and is listed as "In Compliance" for that inspection.

On May 8, 2003, the facility was issued a Notice of Violation alleging noncompliance with recordkeeping and visible emissions observation requirements of the original Title V operating permit dated February 9, 2000. The facility and DEQ then entered into a Consent Order on July 28, 2004. In the interim the facility has been operating under an application shield since their renewal application was submitted in a timely fashion. Nanochemonics came into compliance when a civil charge to resolve the noncompliance was paid in full on April 26, 2007.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

The emissions units at this facility consist of the following :

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
Fuel Burning Equipment							
EU-C-6, 10, 15	6S, 10S, 15S	Combustion units, 3 boilers combined, each burning natural gas with No. 2 fuel oil backup: EU-C-6, 32.00 million Btu/hr, No. 3 Murray 10207 boiler; EU-C-10, 21.76 million Btu/hr, No. 2 Com B-7308 boiler; EU-C-15, 15.36 million Btu/hr, No.1 Springfield HS 1352 boiler.	69.1 million Btu/hr input rated capacity, 3 boilers combined.	None	NA	NA	None - each boiler was installed before 1972.
Process EU-K: Kilns, Calciners							
EU-K-149, 152, 154, 155, 157, 164, 166, 168, 171, 173, 176, 178, 181, 183, 186, 187, 190,	149, 152, 154, 155, 157, 164, 166, 168, 171, 173, 176, 178, 181, 183, 186, 187, 190, 191, 194, 196, 199, 201, 204, 206, 244, 275	22 batch kilns/calciners	22 batch calciners, 0.1 tph each, 17,280 tpy combined	Dust collectors	DCM-01 through 24; DCM-31; DCY-05	PM	May 7, 1998

191, 194, 196, 199, 201, 204, 206, 244, 275							
Process EU-CRK: Continuous Reduction Kiln/Calciner							
EU-CRK- 244	244S	Continuous Reduction kiln/calciner, ABB Raymond	Continuous reducer, 0.33 tph, 2891 tpy.	Dust collector	DCM-31	PM	May 6, 1998
Process EU-D: Dryers, material handling, etc. – all dust-emitting processes other than kilns/calciners							
EU-D-23, 33, 77, 86, 91, 93, 94, 224, 247, 256, 265	23, 33, 77, 86, 91, 93, 94, 224, 247, 256, 265	Combined total of all dust emitting processes other than kilns/calciners, including four rotary dryers, one belt dryer, one magnetite dryer, SP dryer #7, cobalt adsorption plant dryer, one annealer, four mullers, four packers, four ballmills, and miscellaneous processing, material handling and storage equipment	NA	Dust collectors	DCY-01 through DCY-06; DCM-33	PM	May 7, 1998, June 18, 1993, June 26, 1992

*The Size/Rated capacity is provided for informational purposes only, and is not an applicable requirement.

EMISSIONS INVENTORY – Actual Emissions

A copy of the 2005 annual emission update is attached. Emissions are summarized below.

Criteria Pollutant Emissions in Tons/Year				
VOC	CO	SO ₂	PM ₁₀	NO _x
0.404	75.507	0.046	0.636	9.678

NSPS, MACT and CAM APPLICABILITY

NSPS/NESHAPS – None Applicable.

MACT – None Applicable

Boiler MACT – Subpart DDDDD – Not applicable, since units are not burning solid fuel. Further, this rule is held in abeyance at the present time (compliance date delayed) and may be remanded.

CAM (Compliance Assurance Monitoring) – Not Applicable, as CO is the only pollutant with a potential to emit exceeding 100 tpy.

CHANGES TO PLANT

There have been no known changes to the plant and no revisions to the Title V permit since initial issuance. The most recent NSR permit is dated May 7, 1998.

REPORTING

The permittee shall submit reports as follows:

Annual Title V Compliance Certifications
to DEQ and EPA (Region III) by March 1 for the previous calendar year;

Semi-annual Title V Reports
To DEQ by March 1 and September 1 of each year (time periods to be addressed are January 1 to June 30, and July 1 to December 31);

Malfunction or Deviation Reports

To DEQ within 4 daytime business hours after discovery of any malfunctions and any deviations from permit requirements which may cause excess emissions for more than one hour.

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110 that apply to all facilities operating under a Federal-operating permit. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions.

Comments on General Conditions

B. Permit Expiration

This condition refers to the Board taking action on a permit application. The Board is the State Air Pollution Control Board. The authority to take action on permit applications has been delegated to the Regions as allowed by §2.1-20.01:2 and §10.1-1185 of the *Code of Virginia*, and the “Department of Environmental Quality Agency Policy Statement No. 2-2003”.

This general condition cite(s) the Article(s) that follow(s):

Article 1 (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Operating Permits for Stationary Sources

This general condition cites the sections that follow:

9 VAC 5-80-80. Application

9 VAC 5-80-140. Permit Shield

9 VAC 5-80-150. Action on Permit Applications

F. Failure/Malfunction Reporting

Section 9 VAC 5-20-180 requires malfunction and excess emission reporting within four hours of discovery. Section 9 VAC 5-80-250 of the Title V regulations also requires malfunction reporting; however, reporting is required within two days. Section 9 VAC 5-20-180 is from the general regulations. All affected facilities are subject to section 9 VAC 5-20-180 including Title V facilities. Section 9 VAC 5-80-250 is from the Title V regulations. Title V facilities are subject to both sections. A facility may make a single report that meets the requirements of 9 VAC 5-20-180 and 9 VAC 5-80-250. The report must be made within four daytime business hours of discovery of the malfunction.

This general condition cites the sections that follow:

- 9 VAC 5-40-41. Emissions Monitoring Procedures for Existing Sources
- 9 VAC 5-40-50. Notification, Records and Reporting
- 9 VAC 5-50-50. Notification, Records and Reporting

This general condition contains a citation from the Code of Federal Regulations as follows:
40 CFR 60.13 (h). Monitoring Requirements.

J. Permit Modification

This general condition cites the sections that follow:

- 9 VAC 5-80-50. Applicability, Federal Operating Permit For Stationary Sources
- 9 VAC 5-80-190. Changes to Permits.
- 9 VAC 5-80-260. Enforcement.
- 9 VAC 5-80-1100. Applicability, Permits For New and Modified Stationary Sources
- 9 VAC 5-80-1790. Applicability, Permits For Major Stationary Sources and Modifications Located in Prevention of Significant Deterioration Areas

U. Malfunction as an Affirmative Defense

The regulations contain two reporting requirements for malfunctions that coincide. The reporting requirements are listed in sections 9 VAC 5-80-250 and 9 VAC 5-20-180. The malfunction requirements are listed in General Condition U and General Condition F. For further explanation see the comments on general condition F.

This general condition cites the sections that follow:

- 9 VAC 5-20-180. Facility and Control Equipment Maintenance or Malfunction
- 9 VAC 5-80-110. Permit Content

Y. Asbestos Requirements

The Virginia Department of Labor and Industry under Section 40.1-51.20 of the Code of Virginia also holds authority to enforce 40 CFR 61 Subpart M, National Emission Standards for Asbestos.

This general condition contains citations from the Code of Federal Regulations that follow:

- 40 CFR 61.145, NESHAP Subpart M. National Emissions Standards for Asbestos as it applies to demolition and renovation.
- 40 CFR 61.148, NESHAP Subpart M. National Emissions Standards for Asbestos as it applies to insulating materials.

40 CFR 61.150, NESHAP Subpart M. National Emissions Standards for Asbestos as it applies to waste disposal.

This general condition cites the regulatory sections that follow:

9 VAC 5-60-70. Designated Emissions Standards

9 VAC 5-80-110. Permit Content

STATE ONLY APPLICABLE REQUIREMENTS

This permit contains no State Only Applicable requirements.

FUTURE APPLICABLE REQUIREMENTS

No future applicable requirements have been identified for this facility.

INAPPLICABLE REQUIREMENTS

The startup, shut down, and malfunction opacity exclusion listed in 9 VAC 5-40-20 A 3 (for pre-1972 existing emissions units) cannot be included in any Title V permit. This portion of the regulation is not part of the federally approved state implementation plan. The opacity standard applies to existing sources at all times including startup, shutdown, and malfunction. Opacity exceedances during malfunction can be affirmatively defended provided all requirements of the affirmative defense section of this permit are met. Opacity exceedances during startup and shut down will be reviewed with enforcement discretion using the requirements of 9 VAC 5-40-20 E, which state that "At all times, including periods of startup, shutdown, soot blowing and malfunction, owners shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with air pollution control practices for minimizing emissions."

In contrast, the similar startup, shut down, and malfunction opacity exclusion listed in 9 VAC 5-50-20 A 4 (for emissions units that are new or modified since 1972) is SIP-approved and therefore applies to all such emissions units at this facility.

COMPLIANCE PLAN

Not Applicable; Consent Agreement resolved April 26, 2007.

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Insignificant emission units include the following:

Emission Unit No.	Emission Unit Description	Citation	Pollutant(s) Emitted (5-80-720 B)	Rated Capacity (5-80-720 C)
N/A	Ferrous Sulfate Dissolving Tank		yes, PM	
N/A	Copperas Sludge Recovery Tanks (2)		yes	
N/A	NTR - Lab Hoodf		yes, PM	
N/A	Starter Storage Tanks (3)		yes	
N/A	Conversion - A&B Flocc Tanks		yes	
N/A	#4 Conversion Storage Tank		yes	
N/A	Cobalt Zinc Mix Tanks (2)		yes, Cobalt, Zinc, PM	
N/A	Iron Oxide Storage Tanks (40)		yes, PM	
N/A	CA Plant - 5A Copperas Head Tank		yes	
N/A	CA Plant - 10a Waste Caustic Storage Tank		yes	
N/A	CA Plant - TK7 Cobalt Mix Tank		yes, Cobalt	
N/A	CA Plant - TK13 Reslurry Tank		yes	
N/A	CA Plant - #14 Reagent Mix Tank		yes	
N/A	CA Plant - 14a Cobalt Mix Tank		yes, Cobalt	
N/A	CA Plant - Filtration Tank		yes	

Emission Unit No.	Emission Unit Description	Citation	Pollutant(s) Emitted (5-80-720 B)	Rated Capacity (5-80-720 C)
N/A	CA Plant - Product Storage Hoppers		yes, PM	
N/A	CA Plant - Conversion Tank		yes	
N/A	CA Plant - Blender		yes	
N/A	CA Plant - Reuse Caustic 5% Storage Tank		yes	
N/A	CA Plant - 50% Caustic Storage Tank		yes	
N/A	25,000 gallon fuel oil tank		yes	
N/A	Pilot Plant - TK 30		yes	
N/A	Pilot Plant – NTR stack		yes	
N/A	Pilot Plant - Misc. Storage Tanks (9)		yes	
N/A	Pilot Plant - Filter Presses (6)		yes, PM	
N/A	Rotary Dryer Area - Rotary Filters (3)		yes, PM	
N/A	Manufacturing - Filter Presses (2)		yes, PM	
N/A	Packaging		yes, PM	
N/A	R & D - #1 Kiln Hood Exhaust		yes, PM	
N/A	R & D - #1 Kiln Exhaust		yes, PM	
N/A	R & D - #2 Kiln Hood Exhaust		yes, PM	
N/A	R & D - #2 Kiln Exhaust		yes, CO, PM	
N/A	R & D - Flexible Fume Hood - oven room		yes, PM	
N/A	R & D - High Temp. Oven/Kiln Room		yes, CO, PM	

Emission Unit No.	Emission Unit Description	Citation	Pollutant(s) Emitted (5-80-720 B)	Rated Capacity (5-80-720 C)
2	W. T. Lime Storage Tank Dust Collector		yes	
3	Creek Water Pump House		yes	
4	Creek Water Pump House		yes	
5	Boiler House Natural Gas Heater			<10mmBTU
21	Nat. Gas Heater - Y.O. Shop			<10mmBTU
25	#38 Copperas Storage Tank Vent		yes	
26	#39 Caustic Storage Tank Vent		yes	
27	Nat. Gas Heater S.P.			<10mmBTU
28	Nat. Gas Heater S.P.			<10mmBTU
29	Nat. Gas Heater S.P.			<10mmBTU
33	S.P. Dryer Burner Exhaust			<10mmBTU
35	D Reactor Exhaust Stack		yes	
36	#45 Copperas Storage Tank Vent		yes	
37	E Reactor Exhaust Stack		yes	
40	#13 Copperas Storage Tank Vent		yes	
41	#12 Copperas Storage Tank Vent		yes	
42	#11 Copperas Storage Tank Vent		yes	
43	#6 Copperas Cook Tank Stack		yes	
47	#8 Copperas Cook Tank		yes	
49	#1 Copperas Cook Tank		yes	
75	Rotarty Dryer Deaerator Tank Vent		yes	

Emission Unit No.	Emission Unit Description	Citation	Pollutant(s) Emitted (5-80-720 B)	Rated Capacity (5-80-720 C)
79	Black Dust Collector Stack		yes	
92	#6 Belt Dryer Heat Exchanger Stack		yes	
100	#30 Tank Ducon Scrubber Stack		yes	
102	#4 Proctor Dryer Exhaust Stack		yes	
104	#1 & #2 Proctor Dryer Exhaust Stack		yes	
106	#1-2-3 Nat. Gas Hot Water Heater Stack			<10mmBTU
107	#4-5-6 Nat. Gas Hot Water Heater Stack			<10mmBTU
113	Flammable Storage Cabinet Vent		yes	
120	Fume Hood Exhaust Conversion		yes	
121	Exhaust Fan Fume Hood Kiln Room		yes	
122	#1 Dev. Kiln Hood Exhaust		yes	
123	#1 Dev. Kiln Exhaust		yes	
124	#2 Dev. Kiln Hood Exhaust		yes	
125	#2 Dev. Kiln Exhaust		yes	
127	Flexible Fume Hood - Oven Room		yes	
128	High Temp. Oven Kiln Room - Dev.		yes	
141	Nat. Gas Heater - M.O. Shop			<10mmBTU
143	Nat. Gas Heater - Forklift Shop			<10mmBTU
145	Nat. Gas Hot Water Heater - M.O. Shop			<10mmBTU

Emission Unit No.	Emission Unit Description	Citation	Pollutant(s) Emitted (5-80-720 B)	Rated Capacity (5-80-720 C)
150	Nat. Gas High Press. Hot Water Heater			<10mmBTU
151	#24 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
153	#23 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
156	#22 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
158	#21 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
163	Batch Kiln #1 - R & D		yes	
165	#4 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
169	#3 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
170	#6 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
174	#5 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
175	#8 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
179	#7 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
180	#16 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
184	#15 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
185	#18 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
188	#17 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
189	#19 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
192	#20 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
193	#13 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
197	#14 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
198	#11 Kiln Hood Exhaust, Nat. Gas			<10mmBTU

Emission Unit No.	Emission Unit Description	Citation	Pollutant(s) Emitted (5-80-720 B)	Rated Capacity (5-80-720 C)
202	#12 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
203	#9 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
207	#10 Kiln Hood Exhaust, Nat. Gas			<10mmBTU
214	Nat. Gas Hot Water Heaters Stack - 4 ea.			<10mmBTU
215	Air Inlet Control Rm. Hot Water Heater, Nat. Gas			<10mmBTU
216	Nat. Gas Hot Water Boiler			<10mmBTU
229	Nat. Gas Heater - M. O. Drum Storage			<10mmBTU
230	Nat. Gas Heater Air Intake - Blenders			<10mmBTU
232	Nat. Gas Heater - Warehouse			<10mmBTU
233	Nat. Gas Heater - Warehouse			<10mmBTU
242	High Temp. Kiln Burner Exhaust, Nat. Gas			2.4mm BTU
248	5% Caustic Exhaust W.T. Inside Pit		yes	
252	Nat. Gas Heater Y.O. Shop Storage Area			<10mmBTU
257	C.A. Plant - #14 Mix Tank		yes	
260	C.A. Plant - #8-A Storage Tank		yes	
262	50% Caustic Storage Tank - C.A. Plant		yes	
264	Reuse Caustic 5% Storage Tank- C.A. Plant		yes	

Emission Unit No.	Emission Unit Description	Citation	Pollutant(s) Emitted (5-80-720 B)	Rated Capacity (5-80-720 C)
266	High Temp. Kiln Burner Exhaust-Feed End, Nat. Gas			2.4mmBTU
269	High Temp. Kiln Burner Exhaust-Center, Nat. Gas			2.4mmBTU
31A	A Reactor Exhaust		yes	
32A	B Reactor Exhaust		yes	
34A	C Reactor Exhaust Stack		yes	
61A	#2 NTR Tank Stack		yes	
62A	#3 NTR Tank Stack		yes	
70A	#1 NTR Tank Stack		yes	
71A	#4 NTR Tank Stack		yes	
73A	#5 NTR Tank Stack		yes	
74A	#6 NTR Tank Stack		yes	
116A	#8 Conversion Tank Stack		yes	
258A	C.A. Plant - 36-B Process Tank		yes	
259A	C.A. Plant - #6-A Process Tank		yes	

¹The citation criteria for insignificant activities are as follows:

9 VAC 5-80-720 A - Listed Insignificant Activity, Not Included in Permit Application

9 VAC 5-80-720 B - Insignificant due to emission levels

9 VAC 5-80-720 C - Insignificant due to size or production rate

CONFIDENTIAL INFORMATION

The permittee did not submit a request for confidentiality. All portions of the Title V application are suitable for public review.

PUBLIC PARTICIPATION

The proposed permit was advertised for public notice in the Roanoke Times on June 17, 2007 for concurrent review. The required 30-day public notice period closed on July 17, 2007 with no comments received from any parties. EPA's 45-day concurrent review period ended August 1, 2007 with no comments received from EPA. The permit is therefore being processed for final issuance.